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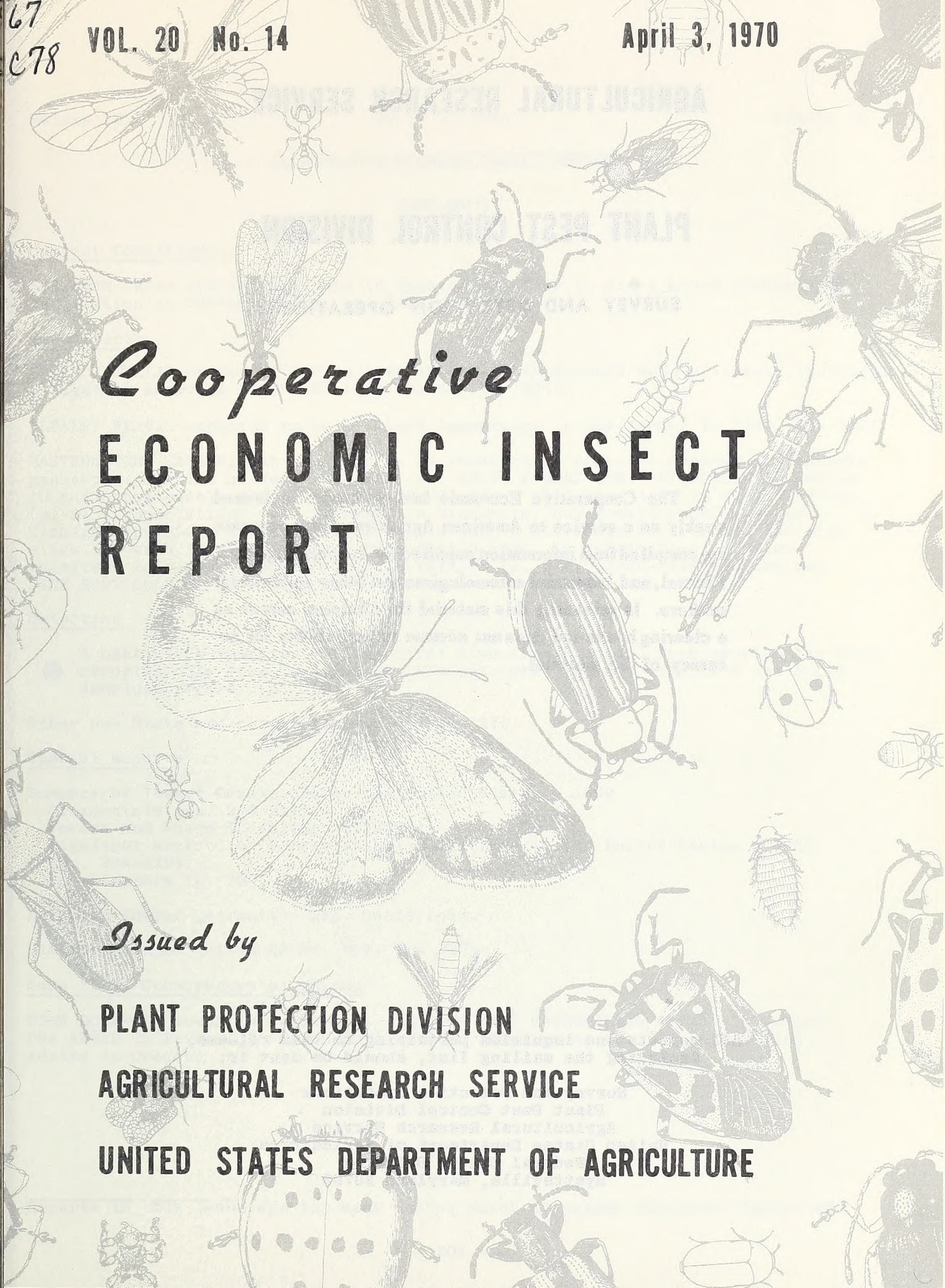

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PROTECTION DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20782

Volume 20 April 3, 1970 Number 14

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

EUROPEAN CRANE FLY larvae found in Washington. This is first known established infestation in United States. (p. 215).

Predictions

POTATO PSYLLID survey of spring breeding areas in Arizona and California indicates a light to moderate potential this season. (p. 211).

ALFALFA WEEVIL expected to be of minor importance in New Jersey in 1970. (p. 212).

EASTERN TENT CATERPILLAR expected to be moderate to heavy in central and eastern panhandle counties of West Virginia. (p. 213). FOREST TENT CATERPILLAR expected to cause noticeable defoliation on 60,000 acres of forest land in West Virginia (p. 213); populations will increase in Minnesota, but remain about same in Michigan (p. 220). SPRUCE BUDWORM population in Minnesota expected to increase slightly, with further increase of infested area. An infestation in Maine threatens to cause increased tree mortality. (p. 218). JACK-PINE BUDWORM and PINE ROOT COLLAR WEEVIL may be more numerous in Michigan. (p. 218).

Detection

● A GALL MIDGE reported for the first time from Florida. This species has been reported only from Cuba and St. Vincent, West Indies. This is a new North American record. (p. 213).

Other new State and county records on page 215.

Special Reports

Summary of Insect Conditions in the United States - 1969
  Ornamentals (pp. 216-217).
  Forest and Shade Trees (pp. 217-228).
  Highlight section of Forest Insect Conditions in the United States - 1969 (pp. 224-228).
  Contributors (p. 229).

European Chafer Quarantine Map. Centerfold.

Distribution of Cattle Grubs. Map. (p. 230).

Some First Occurrences of Season

PINK BOLLWORM moths in California; WESTERN TENT CATERPILLAR larvae in Nevada; PEA APHID in Nevada; BLACK CHERRY APHID in Washington; and ELM LEAF BEETLE adults in Oregon.

Reports in this issue are for week ending March 27 unless otherwise indicated.

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WEATHER OF THE WEEK ENDING MARCH 30

HIGHLIGHTS: Temperatures ranged widely from below zero in parts of the northern Great Plains to above 90° at some desert locations in southern California. Heavy snow plagued parts of the Northeast and tornadoes and violent thunderstorms struck the Deep South.

PRECIPITATION: At the beginning of the week snow fell from Michigan to the northern and central Appalachians. By 7 a.m., Monday, the snow depth at Rumford, Maine, reached 22 inches. About 10 inches fell during the day in the mountains in northeastern Tennessee. A Pacific storm moved inland bringing rain to the northern Pacific coast and snow to the mountains. This storm gained strength as it crossed the Rocky Mountains and moved into the central Great Plains. Winds gusted to 80 to 90 m.p.h. at Fort Collins, Colorado, and to 60 m.p.h. at Denver on Tuesday afternoon. Violent weather, tornadoes and heavy thunderstorms, occurred on Wednesday in connection with the intensifying storm. Tornado reports came from Arkansas and Illinois. Heavy snow fell in the north-central States accumulating to a foot or more in northeastern Illinois, northern Indiana, and Lower Michigan. Strong winds piled the snow in 4-foot drifts in places. Transportation and communication facilities were slowed or halted. Much of the western half of the Nation received less than 0.25 inch of precipitation during the week. No rain or only light sprinkles fell in California and nearby parts of neighboring States. On Friday, strong winds drifted the snow badly in the Texas Panhandle and raised clouds of dust in southwestern Texas. Frontal activity late in the week brought 8 to 15 inches of snow to parts of the Northeast from Kentucky to New England. Severe thunderstorms, accompanied by strong winds, violent lightning, and torrential rains occurred in the central and eastern Gulf States. Jacksonville, Florida, received over 7 inches in 2 days. Totals across the Florida Peninsula in the vicinity of Fort Myers ranged from 4 to 8 inches.

Weather continued on page 228.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

Potato Psyllid Survey, Spring Breeding Areas of Arizona and California - 1969

The 1970 spring survey for potato psyllid (*Paratrioza cockerelli*) was conducted March 6-12 in the overwintering areas of Arizona and California. *Lycium* spp., the preferred wild host, was in poor condition or dormant at many locations in Arizona and California, except for agricultural areas where roadside runoff or irrigation had supplemented moisture from rains.

Comparison of average populations per 100 sweeps on overwintering hosts found during spring surveys from 1964 through 1970 are as follows:

State	District	1970	1969	1968	1967	1966	1965	1964
Arizona	Tucson, Phoenix	137	407	214	34	73	508	158
California	Blythe, Barstow	363	167	120	8	228	87	100

Results of the survey indicate a light to moderate migration potential this season. (PPD West. Reg.).

ARMY CUTWORM (*Chorizagrotis auxiliaris*) - COLORADO - Early instars ranged up to 1 per linear foot of wheat at New Raymer, Weld County. Feeding light. None found elsewhere in Weld, Logan, and Washington Counties. (Johnson).

GREENBUG (*Schizaphis graminum*) - NEW MEXICO - Light on wheat in Curry County. Ungrazed fields show heavier infestations. (N.M. Coop. Rpt.). KANSAS - Range per linear foot of wheat by county as follows: Commanche 5-300, Barber up to 70, Clark up to 20, and Pratt up to 10. Trace in Meade and Chautauqua Counties. Surveys negative in 4 south-central, 1 central, and 7 southeast counties. Predators in few fields in Clark and Comanche Counties. (Redding, Martinez). ARKANSAS - Light in southwest area small grain. (Boyer).

CORN, SORGHUM, SUGARCANE

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - WISCONSIN - Overwintering larval survival 85 percent at Hancock, Waushara County, and at Monroe, Green County. (Wis. Ins. Sur.).

SMALL GRAINS

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Ranged 25-50 per linear foot in wheat in Cimarron County. Most damaging pest in wheat at present. (Okla. Coop. Sur.).

WINTER GRAIN MITE (*Penthaleus major*) - OKLAHOMA - Light, up to 4 per linear foot, in Mayes County wheat. Averaged 50 per linear foot in Noble County. (Okla. Coop. Sur.).

PALE WESTERN CUTWORM (*Agrotis orthogonia*) - COLORADO - Larval counts 7-8 per linear foot in border of small-grain field in northeast Washington County. (Pilcher).

TURF, PASTURES, RANGELAND

WESTERN TENT CATERPILLAR (*Malacosoma californicum*) - NEVADA - First instars on desert peach (*Prunus andersonii*) and bitterbrush (*Purshia tridentata*) in southern Washoe County. Hatch not complete. (Adams, Bechtel).

VEGETABLE WEEVIL (*Listroderes costirostris obliquus*) - CALIFORNIA - Larvae heavy and damaging dichondra at Modesto, Stanislaus County. (Cal. Coop. Rpt.).

AN APHID (Asiphonella dactylonii) - CALIFORNIA - Adults of this species and Chorizococcus rostellum (a mealybug) heavy locally on Bermuda grass at Santa Paula, Ventura County. (Cal. Coop. Rpt.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - ARKANSAS - Variable in southwest area: Adults ranged 12-15 and larvae 5-6 per 100 sweeps along Red River in Miller County. Larvae ranged 800-1,000 and adults 5-10 per 100 sweeps 20 miles south and across river in Lafayette County. Specimens taken in Howard County. This is a new county record. (Boyer). TENNESSEE - Light in alfalfa in western area. (Cagle et al.). NEW JERSEY - Expected to be minor pest in 1970. (Race, Mar. 20). UTAH - Adults numerous in poplar duff near alfalfa at Salt Lake City, Salt Lake County. (Knowlton, Mar. 27). NEVADA - First eggs of season light and spotty in Mason and Smith Valleys, Lyon County, and in southern Washoe County. (Adams, Bechtel).

CLOVER LEAF WEEVIL (Hypera punctata) - MISSOURI - Light in east-central and southeast areas. Larvae ranged 1-2 per square foot of alfalfa in Ste. Genevieve County. (Hanning). Larval counts averaged 1.5 per square foot in alfalfa and 2.0 per square foot in red clover in Cape Girardeau County. (Munson).

PEA APHID (Acyrthosiphon pisum) - NEVADA - Light in Clark County alfalfa. (Zoller). Appearing in alfalfa in Lyon and southern Washoe Counties. (Adams, Bechtel). NEW MEXICO - Moderately heavy, ranged 20-50 per square foot, in alfalfa around Roswell, Chaves County. (Mathews). OKLAHOMA - Ranged 25-100 per square foot in alfalfa in Mayes County. Averaged 50 per square foot in Noble County. (Okla. Coop. Sur.). MISSOURI - Light, up to 15 per 10 sweeps, in alfalfa checked in southeast area. (Munson). ARKANSAS - Light, ranged 50-75 per 100 sweeps of clover and alfalfa in southwest area. (Boyer). TENNESSEE - Moderate in alfalfa in western area. Buildup expected. (Cagle et al.).

POTATOES, TOMATOES, PEPPERS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - CALIFORNIA - Larvae light and damaging 10-acre tomato planting at Otay, San Diego County. (Cal. Coop. Rpt.).

DECIDUOUS FRUITS AND NUTS

BLACK CHERRY APHID (Myzus cerasi) - WASHINGTON - Hatching underway in Wenatchee, Chelan County, March 23. (Rushmore).

CITRUS

Citrus Insect Situation in Florida - Mid-March - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 74 (norm 61) percent of groves; economic in 42 (norm 41) percent. Increased on leaves and remained in high range, decreased to moderate range on fruit. Both levels slightly above normal. Little change expected. Highest districts west, south, and east. CITRUS RED MITE (Panonychus citri) infested 48 (norm 39) percent of groves; economic in 18 (norm 15) percent. Increased and slightly above normal for March, but still in low range. Little change expected. Highest district west. TEXAS CITRUS MITE (Eutetranychus banksi) infested 20 (norm 31) percent of groves; economic in 3 (norm 14) percent. Population below average and in very low range. It will remain low. Highest district west. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) infested 6 percent of groves; economic in 1 percent. Normal population level for March. Gradual increase expected. GLOVER SCALE (Lepidosaphes gloverii) infested 82 (norm 80) percent of groves; economic in 10 (norm 16) percent. Below normal and in moderate range. Slight increase expected. Highest districts south and east. PURPLE SCALE (L. beckii) infested 68 (norm 79) percent of groves; economic in 6 (norm 9) percent. Below normal and in low range. Slight increase expected. Highest district west. CHAFF SCALE (Parlatoria pergandii) infested 48 (norm 61) percent of groves; economic in 2 (norm 10) percent. Below normal and in low range. Little change expected. Highest district north. BLACK SCALE (Saissetia oleae) infested 13 (norm 30) percent of groves; economic in 2 (norm 13) percent. Beginning to recover from cold weather set-back in January. Population much below normal and very low. Highest district west. YELLOW SCALE (Aonidiella citrina) infested 61 (norm 63) percent of groves; economic in 9 (norm 12) percent. Population near normal moderate level for March. Slight increase expected. Highest districts north and east. An ARMORED SCALE (Unaspis citri) infested 25 percent of groves; 8 percent moderate. Population low but is highest on record for February. Increase expected. WHITEFLIES infested 59 percent of groves; economic in 37 percent. Population in high range and higher than in March of prior 18 years. Further increase expected. APHIDS infested 8 percent of groves. Light to date but will increase and intensify greatly until late April. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

ORNAMENTALS

A GALL MIDGE (Neolasioptera portulacae (Cook)) - FLORIDA - Seven adults and one gall collected from Portulaca oleracea at Dania, Broward County, April 11, 1962, by D.P.B. McLean. Determined by R.J. Gagne. This is a new North American record. This species has been reported from only Cuba and St. Vincent, West Indies. (Fla. Coop. Sur.). Little is known of the economic importance of this gall midge. (PPD).

GREEN SHIELD SCALE (Pulvinaria psidii) - CALIFORNIA - All stages medium on Philodendron sp. in nursery at Sacramento, Sacramento County. Collected by C.A. Mellor, March 19. Determination by R. Wilkey. (Cal. Coop. Rpt.).

A SNAIL (Otala vermiculata) - TEXAS - Damaging shrubbery and trees at Waco, McLennan County, March 25. Collected by D.J. Markwardt. Determined by W.J. Byas. This is a new county record. Common food snail in Mediterranean countries. Locally introduced into New Orleans, Louisiana. Also reported from California and Ohio. (PPD).

FOREST AND SHADE TREES

EASTERN TENT CATERPILLAR (Malacosoma americanum) - WEST VIRGINIA - Moderate to heavy infestations expected in central and eastern panhandle counties; egg masses ranged 5-10 per 10 wild black cherry trees. Light infestations expected throughout remainder of State; egg masses ranged zero to 4 per 10 trees in February. (W. Va. Ins. Sur.). FLORIDA - Last instars seeking pupation sites at Gainesville, Alachua County. (Mead).

FOREST TENT CATERPILLAR (Malacosoma disstria) - WEST VIRGINIA - Egg masses ranged 1-17 per sampled plot in Tyler, Wetzel, Ohio, and Marshall Counties. These are new county records. Expect 60,000 acres of forest land to be noticeably defoliated and 12,000 additional acres infested with no noticeable defoliation. Increase expected in Tucker County but no egg masses found March 4. (W. Va. Ins. Sur.).

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) - CALIFORNIA - Early instars heavy on oak trees in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (Pyrrhalta luteola) - OREGON - Adults noted at Salem, Marion County, March 25. (Westcott).

A CECIDOMYIID MIDGE (Cecidomyia piniinopis) - OREGON - General, especially on lodgepole pine (Pinus contorta) at Portland, Multnomah County. Much heavier than normal. (Larson).

A SAWFLY (Neodiprion pratti pratti) - WEST VIRGINIA - Eggs averaged 110 per 3-inch twig on pitch pine in Lincoln County, March 19. Heavy infestation expected. (W. Va. Ins. Sur.).

A PINE BARK APHID (Pineus sylvestris) - CALIFORNIA - Adults heavy, 30-20 per twig, on Scotch pine nursery stock at Escondido, San Diego County. (Cal. Coop. Rpt.).

MAN AND ANIMALS

SCREW-WORM (Cochliomyia hominivorax) - No cases reported in U.S. March 22-28. Total of 55 laboratory-confirmed cases reported in portion of Barrier Zone in Republic of Mexico March 15-21 as follows: Baja California 1, Sonora 39, Chihuahua 8, Tamaulipas 7. Total of 15 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 6,728,000; Mexico 129,714,000. (Anim. Health Div.).

COMMON CATTLE GRUB (Hypoderma lineatum) - WYOMING - Larvae ranged 1-11 (averaged 4.6) on 14 untreated cows and 6-40 (averaged 16.3) on 14 untreated calves at Gillette, Campbell County, on January 20. (Lloyd). Larvae ranged 0-9 (averaged 1.5) in 18 untreated yearlings at Torrington, Goshen County, on March 3. (Lloyd, Parshall). TENNESSEE - Inspection of 35 cattle negative in Benton County. (Cagle).

FACE FLY (Musca autumnalis) - CALIFORNIA - Hibernating adults annoying in households in Anderson, Shasta County, and Dunsmuir, Siskiyou County. (Cal. Coop. Rpt.).

HOUSE FLY (Musca domestica) - NEW JERSEY - Heavy in heated calf pen in Somerset County. (Ins.-Dis. Newsltr.).

CATTLE LICE - ALABAMA - Heavy on numerous untreated beef cattle herds in Wilcox and Mobile Counties. (Farquhar, Vickery).

HOUSEHOLDS AND STRUCTURES

ELM LEAF BEETLE (Pyrrhalta luteola) - MARYLAND - Overwintered adults becoming active in and around homes in the southwest areas of Baltimore City. (U. Md., Ent. Dept.).

BOXELDER BUG (Leptocoris trivittatus) - MARYLAND - Adults annoying homeowners in Montgomery, Baltimore, Anne Arundel, and Prince Georges Counties. (U. Md., Ent. Dept.).

A CARPENTER ANT (Camponotus subbarbatus) - WEST VIRGINIA - Specimen collected in Hampshire County June 1, 1968, by J. Brooks. Determined by D.R. Smith. This is a new State record. (W. Va. Ins. Sur.).

BENEFICIAL INSECTS

BIG-EYED BUGS (Geocoris spp.) - OKLAHOMA - Light, 0-1 per square foot, in alfalfa in Mayes County. (Okla. Coop. Sur.). ARKANSAS - Adults ranged 5-10 in 100 sweeps of alfalfa in southwest area. (Boyer).

DAMSEL BUGS (Nabis spp.) - ARKANSAS - Adults ranged 25-30 in 100 sweeps of alfalfa in southwest area. (Boyer).

A FLOWER BUG (Orius insidiosus) - ARKANSAS - Light, ranged 5-10 in 100 sweeps, in alfalfa in southwest area. (Boyer).

CONVERGENT LADY BEETLE (Hippodamia convergens) - OKLAHOMA - Adults light, 0-3 per square foot, in alfalfa in Mayes County. Two larvae noted in wheat in Noble County. (Okla. Coop. Sur.). ARKANSAS - H. convergens and Coleomegilla maculata ranged 12-15 in 100 sweeps of alfalfa in southwest area. (Boyer).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

EUROPEAN CRANE FLY (Tipula paludosa) - WASHINGTON - Larvae heavy, 75-100 per square foot, in sod at Peace Arch State Park in Blaine, Whatcom County. Collected March 18, 1970, by T. Knovbaugh after treatment of small sod area. Determined by A. Stone. This is first known established larval infestation in United States, although adults previously collected in blacklight traps at several localities in Whatcom and Skagit Counties. Damaging populations causing losses to homeowners, farmers, and municipalities throughout Fraser Valley in Canada, immediately north of United States-Canadian border. (PPD).

PINK BOLLWORM (Pectinophora gossypiella) - CALIFORNIA - Trapped 1 native and 1 sterile moth in Coachella Valley and 2 native moths in Borrego Springs. First of season. Released 978,500 sterile moths in Coachella Valley; total to date 1,293,500. (PPD).

HAWAII INSECT REPORT

Corn - All stages of CORN PLANTHOPPER (Peregrinus maidis) heavy in 0.5 acre of old sweet corn at Halawa, Oahu. Nymphs and adults of Tytthus mundulus (cane leafhopper egg sucker) moderate in same area. (Kawamura).

General Vegetables - GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) moderate to heavy in snap beans at Waimanalo, Oahu, despite intensive spraying. All stages of BEAN FLY (Melanagromyza phaseoli) trace to light in most commercial snap bean plantings at Waimanalo, Oahu. Larvae moderate in 2-inch-high snap bean seedlings at Pearl City. (Kawamura).

Forest and Shade Trees - Larvae of KOA HAOLE LOOPER (Anacamptodes fragilaria) moderate to heavy on koa haole (Leucaena glauca), kiawe (Prosopis pallida), and klu (Acacia farnesiana) on Oahu; heavy at Waikapu, Maui, 100+ acres of koa haole 90 percent defoliated. (Miyahira et al.).

Beneficial Insects - All stages of a SCIOMYZID FLY (Sepedon sauteri) heavy in one acre of taro (Colocasia esculentum) at Waihee, Maui. (Davis, Miyahira). All stages of a LADY BEETLE (Coccinella septempunctata brucki) recovered in farm areas at Pearl City, Waimanalo, and Halawa, Oahu. (Kawamura).

Miscellaneous Insects - Adults of an ICHNEUMON WASP (Diplazon laetatorius) heavy (7 per sweep) in weeds bordering farm areas at Waianae, Oahu. Parasitizes aphid-feeding syrphids. (Funasaki).

DETECTION

New North American Record - A GALL MIDGE (Neolasioptera portulacae (Cook)) FLORIDA - Broward County (p. 213).

New State Record - A CARPENTER ANT (Camponotus subbarbatus) WEST VIRGINIA - Hampshire County (p. 214).

New County Records - ALFALFA WEEVIL (Hypera postica) ARKANSAS - Howard (p. 212). A SNAIL (Otala vermiculata) TEXAS - McLennan and FOREST TENT CATERPILLAR (Malacosoma disstria) WEST VIRGINIA - Marshall, Ohio, Tyler, Wetzel (p. 213). EUROPEAN PINE SAWFLY (Neodiprion sertifer) WEST VIRGINIA - Pocahontas (p. 219). SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) SOUTH DAKOTA - Hughes (p. 223).

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 3/20-26, BL - Granulate cutworm (Feltia subterranea) 9, salt-marsh caterpillar (Estigmene acrea) 3. TEXAS - Waco - 3/20-26, BL - Armyworm (Pseudaletia unipuncta) 39, black cutworm (Agrotis ipsilon) 2, corn earworm (Heliothis zea) 1, granulate cutworm 8, variegated cutworm (Peridroma saucia) 105.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1969

(Continued from page 208)

ORNAMENTALS

Highlights:

BAGWORM caused heavy damage to evergreen shrubs in several States. TEA SCALE was serious on camellia and holly in Alabama and Florida. JUNIPER SCALE was severe in many areas of Utah and in areas of Idaho. EUROPEAN EARWIG continued to spread in Pennsylvania. SPIDER MITES were serious on a variety of ornamentals in several areas.

BAGWORM (*Thyridopteryx ephemeraeformis*) populations and damage increased in NEBRASKA. Many junipers were 40 and 50 percent defoliated. Infestations in KANSAS were most numerous on junipers. Bagworm was also found on cotoneaster and honeylocusts. Heavy populations damaged evergreens in many areas of OKLAHOMA during summer. Heavy throughout TENNESSEE on several species of plants, infestations were heaviest in east and central areas. Bagworm is still the most destructive pest of coniferous shrubs throughout ALABAMA.

Bagworm caused heavy damage to many ornamentals in July and August in parts of WEST VIRGINIA. More than 50 percent defoliation of junipers and black locusts occurred in Ohio, Cabell, and Mason Counties. Some Norway spruce were lightly damaged in Kanawha County and 3-4 acres of white pine were infested in Wirt County. The greatest loss occurred to nursery stock and home ornamentals. Most nursery stock was treated. Damage should be light in 1970, but populations will probably be heavy in West Virginia. Bagworm larvae were heavy on newly planted shrubs and trees along highways in MARYLAND. This was the most frequently encountered pest of nursery stock in the State in 1969. Injury to arborvitae in DELAWARE was severe in some cases and especially noticeable in early August when most larvae were fully grown.

Other Lepidoptera were of some concern in several Western States. LILAC LEAF MINER (*Gracillaria syringella*) infestations were reported from several locations in Lemhi, Custer, Madison, Lincoln, and Bannock Counties, IDAHO. FALL WEBWORM (*Hyphantria cunea*) was heavy on trees and ornamentals in Clark County in July and on roadside shrubbery and trees in many counties in eastern and central WASHINGTON. AZALEA LEAF MINER (*Gracillaria azaleella*) was locally heavy on azaleas in northern CALIFORNIA, and larvae of a NOCTUID MOTH (*Platypolia loda*) seriously damaged a commercial planting of tiger lilies at Colfax, Placer County.

FULLER ROSE WEEVIL (*Pantomorus cervinus*) damaged ornamentals throughout CALIFORNIA. Adults of HOLLYHOCK WEEVIL (*Apion longirostre*) were collected at Seattle, King County, WASHINGTON, June 29. This was the first record for the western part of the State. This weevil was also abundant in Whitman County in late May. BLACK VINE WEEVIL (*Brachyrhinus sulcatus*) larvae were heavy on the roots of 10,000 container-grown blue spruce in a nursery at Tumwater, Thurston County, WASHINGTON. *B. sulcatus* was again serious in some CONNECTICUT areas. Many foundation plantings around public buildings were lost. A JAPANESE WEEVIL (*Pseudocneorhinus bifasciatus*) severely damaged ornamentals in many areas of VIRGINIA from Norfolk to Richmond to Fairfax in late summer. A WEEVIL (*Rhynchophorus cruentatus*) was occasionally serious on palms in FLORIDA. Damage was estimated at $5,000 in one nursery.

OYSTERSHELL SCALE (*Lepidosaphes ulmi*) was heavy on lilac and cotoneaster in WYOMING. Infestations in SOUTH DAKOTA continued unabated on lilacs at Rapid City, Pennington County, and Spearfish, Lawrence County. Eggs in WISCONSIN were less numerous than in previous years due to predation by a pyemotid mite in Dane

County. Populations on lilac were lighter than in previous years. Oystershell scale continued heavy on lilacs in MICHIGAN. Failure to recognize early infestations and to apply suitable controls were major factors in this pest's continued presence.

The following were some of the major armored scale pests. Many heavy infestations of EUONYMUS SCALE (*Unaspis euonymi*) continued to occur throughout DELAWARE. *U. euonymi* continues as a major pest year after year in MICHIGAN. Infestations on pachysandra are becoming more routine and difficult to control. *Diaspis boisduvalii* severely damaged orchids in Hamilton County, TENNESSEE. TEA SCALE (*Fiorinia theae*) was the most destructive and widespread scale on camellia and Burford hollies in ALABAMA. *F. theae* remained serious on camellias and Chinese holly in FLORIDA. JUNIPER SCALE (*D. carueli*) was moderate to severe about homes in many parts of UTAH. In IDAHO, juniper scale was severe on ornamental junipers at Twin Falls, Twin Falls County, in early May and at Nampa, Canyon County, in late August. Some shrubs were killed.

A SOFT SCALE (*Pulvinaria floccifera*) infested English holly trees at residences in Portland, Multomah County, OREGON. The scales were especially abundant on ventral leaf surfaces. Honeydew and sooty mold were conspicuous on dorsal leaf surfaces. FLETCHER SCALE (*Lecanium fletcheri*) was lighter than usual in Dane County, WISCONSIN. Erratic early summer weather in MICHIGAN adversely affected control of *L. fletcheri* on yew. This scale has become a major nursery problem, but should be only an incidental pest with correct practices. HEMISPHERICAL SCALE (*Saissetia coffeae*) continued to be an important pest of greenhouse plants, palms, and cycads in FLORIDA. *Ceroplastes* spp. continued to spread in eastern VIRGINIA, and damage increased. In MARYLAND, *Ceroplastes* spp. have been increasing over the past 3 years in foundation plantings and at nursery outlets.

Specimens of a MEALYBUG (*Rhizoecus cacticans*) were found on the roots of African-violet (*Saintpaulia ionantha*) at Bellingham, Whatcom County, WASHINGTON, for a new State record. A SPITTLEBUG (*Clastoptera juniperina*) was reported from Rocky Mountain juniper (*Juniperus scopulorum*) at Malad, Oneida County, for a new State record in IDAHO. Whiteflies, mostly CITRUS WHITEFLY (*Dialeurodes citri*), remained among the worst pests of a variety of ornamentals in FLORIDA, including gardenia, viburnum, ligustrum, and ornamental citrus.

EUROPEAN EARWIG (*Forficula auricularia*) continued to spread in PENNSYLVANIA. Small pockets of infestations one or two years ago are now countywide in scope. This earwig was very damaging to yard plants and flowers in CALIFORNIA.

SPIDER MITES were the most prevalent and injurious pests on various ornamentals in NEVADA. TWO-SPOTTED SPIDER MITE (*Tetranychus urticae*) and other spider mites were constant pests of roses, azaleas, holly, and many other shrubs and annual flowers throughout ALABAMA. *T. urticae* was serious on a variety of ornamentals, especially roses, in FLORIDA.

BROWN GARDEN SNAIL (*Helix aspersa*) damaged nursery stock at Medford, Jackson County, OREGON. Populations have been steadily increasing for several years. This snail was very abundant and damaging to ornamentals in CALIFORNIA.

FOREST AND SHADE TREES

Highlights:

SPRUCE BUDWORM was a pest of shelterbelt trees in Montana and defoliation ranged moderate to heavy in Minnesota. NANTUCKET PINE TIP MOTH damaged Scotch pine in Kansas, slash pine in Florida, and Virginia pine in Maryland. PINE LEAF CHERMID was of much concern on red spruce and white pine in West Virginia. PINE NEEDLE SCALE was epidemic in the Lake Tahoe area of California, and was prevalent on ornamental and plantation pines in central and northeast Pennsylvania. PINE TORTOISE SCALE was of concern to Christmas tree growers in west Pennsylvania. TENT CATERPILLARS again defoliated many deciduous trees in several areas. EASTERN TENT CATERPILLAR was the most important forest pest in Ohio, and populations were heavy throughout West Virginia and in several areas of Maryland. Larvae of a TORTRICID MOTH defoliated several thousand acres of oak in Michigan. SADDLED PROMINENT was troublesome in Michigan, and defoliated 50,000 acres in Pennsylvania. An OLETHREUTID MOTH damaged white oaks in Pennsylvania. ELM LEAF BEETLE caused some defoliation in several areas. SMALLER EUROPEAN ELM BARK BEETLE increased in Minnesota. WALKINGSTICK defoliated 5 square miles of hardwoods in Minnesota.

SPRUCE BUDWORM (Choristoneura fumiferana) was a pest of shelterbelts and ornamental fir and spruce in MONTANA. The main areas affected were Butte, Silver Bow County, and Plentywood, Sheridan County. C. fumiferana defoliation in MINNESOTA was moderate to heavy on 437,760 acres and light on 1,958,400 acres. Balsam fir and white spruce mortality was low. The outlook for 1970 is a slight increase in population, with a further increase of the infested area. JACK-PINE BUDWORM (C. pinus) moth flights and damage in MICHIGAN increased after a 3-year reduction. Several pine plantings in Oceana and Muskegon Counties showed severe damage. This pest will be more evident in 1970.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) infestations on ornamental pine in OREGON were sprayed at Hermiston, Umatilla County. Control was directed against the moths, in contrast to sprays against the larvae in 1968. A new, established infestation was found in southwest Portland, Multnomah County. Sprays were applied in June when the adults were flying. A small infestation was found at a residence in northwest Portland. Known adult populations appear to be lower than in 1968. NANTUCKET PINE TIP MOTH (R. frustrana) injury resulted in unmarketable Scotch pines for Christmas trees in KANSAS. Infestations in MISSOURI were heaviest in Butler, St. Francois, and Ste. Genevieve Counties, and light in Jasper, Greene, Wright, Oregon, Shannon, Washington, and Carter Counties. R. frustrana was largely a pest of 2 to 8-year-old pines used as highway and lawn shade trees in ALABAMA. In FLORIDA, R. frustrana was unusually severe on a young slash pine plantation of 100 acres near Gainesville, Alachua County, in May, and was heavy in a young loblolly pine plantation of 140 acres near Chiefland, Levy County, in late summer. R. frustrana and R. subtropica were generally heavy on loblolly and slash pines during spring in north Florida. In MARYLAND, R. frustrana damaged 40-80 percent of the tips on Virginia pines in Prince Georges and Anne Arundel Counties.

A PINE NEEDLE-SHEATH MINER (Zelleria haimbachi) damage was above normal to home and Christmas tree plantings in Clackamas and Multnomah Counties, OREGON. In scattered areas near Medford, Jackson County, damage was severe to native ponderosa pine. WESTERN HEMLOCK LOOPER (Lambdina fiscellaria lugubrosa) declined on Mt. Baker National Forest, Whatcom County, WASHINGTON, due probably to parasites. A total of 750 acres was infested in the west area. PINE TUSSOCK MOTH (Dasychira plagiata) increased for the third consecutive season in northern Pine and southern Carlton Counties, MINNESOTA. Chemical control will be needed on 1,000 acres of jack pine in northern Pine County in 1970. A GELECHIID MOTH (Exoteleia nepheos) in new locations of Ottawa and Ingham Counties, MICHIGAN, indicate establishment over a broad area. It shows every indication of becoming a problem in coming years. Scotch pine appears to be the prime host, but other Pinus spp. are probably susceptible.

PINE ROOT COLLAR WEEVIL (Hylobius radicis) heavily infested many Christmas tree plantings in Wexford, Missaukee, and Newaygo Counties, MICHIGAN. Injury was light on treated trees and severe in many abandoned plantings. With this type of planting increasing, it could be more numerous in 1970. Adult damage by PALES WEEVIL (H. pales) in cut-over pine plantings in MICHIGAN is increasing. Failure to treat stumps allowed it to increase. While no population explosion is expected, increase will continue in 1970. H. pales appears to have been increasing on pine in WEST VIRGINIA.

WHITE-PINE WEEVIL (Pissodes strobi) seems to be increasing in WEST VIRGINIA, especially in the eastern panhandle. Damage to white pine throughout RHODE ISLAND was heavy by August 19.

PINE BARK APHID (Pineus strobi) was troublesome in nursery plantations of Norway pine throughout MINNESOTA. PINE LEAF CHERMID (P. pinifoliae) was abundant throughout the red spruce and white pine range of WEST VIRGINIA. It is considered one of the more important conifer insects in the State. If populations continue to increase, mortality could be prevalent in both red spruce and white pine. The southern limit of the white pine range is not yet heavily infested. EASTERN SPRUCE GALL APHID (Adelges abietis) and COOLEY SPRUCE GALL APHID (A. cooleyi) remained heavy on all species of spruce and fir in PENNSYLVANIA. Over 100 inquiries from home gardeners were received. Protective treatments were applied against A. abietis to about 80 percent of Norway and white spruce Christmas tree plantations and against A. cooleyi to about 50 percent of the older fir plantations.

An epidemic of PINE NEEDLE SCALE (Phenacaspis pinifoliae) in the Lake Tahoe area of CALIFORNIA threatened thousands of pines. This scale heavily infested spruce and pine in WYOMING. In MONTANA, pine needle scale was serious on spruce in Beaverhead, Carbon, Park, Sweet Grass, and Stillwater Counties. This armored scale was prevalent on ornamental and plantation pines throughout central and northeast PENNSYLVANIA. One Christmas tree plantation in Luzerne County lost 10,000 trees; another plantation in Lycoming County had at least 40 percent of the trees ruined.

SPRUCE BUD SCALE (Physokermes piceae) was general on Colorado blue spruce at Boise, Ada County, IDAHO, in late May and early June. Control was required. PINE TORTOISE SCALE (Toumeyella numismaticum) appeared to be increasing in MICHIGAN. Poorly timed controls and lack of early detection contributed to this increase. T. numismaticum was of concern to all Christmas tree growers in west PENNSYLVANIA. The outbreak was centered in Indiana County; light to moderate infestations were scattered throughout the State. At least 5,000 acres were moderately to heavily infested.

A CONIFER SAWFLY (Neodiprion taedae linearis) in MISSOURI completely defoliated a 3-acre shortleaf pine plantation in St. Francois County and a 3-acre plantation in Bollinger County. RED-HEADED PINE SAWFLY (N. lecontei) infested plantation-grown trees in Texas, Dent, St. Francois, and Maries Counties, MISSOURI. EUROPEAN PINE SAWFLY (N. sertifer) infestations in INDIANA were more frequent than in past years. In OHIO, heavy infestations of N. pratti pratti occurred in Adams, Scioto, Ross, Pike, and Gallia Counties. Infested areas appear to be increasing annually. Most infestations resulted in 50-75 percent or more defoliation. Second instars of N. sertifer were collected from pitch and red pine on May 20, 1969, in Pocahontas County, WEST VIRGINIA. Determination was made by D.L. Schuder. This is a new county record. N. pratti pratti, first collected in Boone County in 1966, has now spread in WEST VIRGINIA into Wayne, Kanawha, and Lincoln Counties. An outbreak of N. lecontei occurred during spring in FLORIDA on nearly 1,000 acres of year-old slash pine in Taylor County. Red-headed pine sawfly and N. merkeli occurred in an outbreak on slash pine in Glades County in November. N. excitans severely defoliated 100 acres of large loblolly pines near Williston, Levy County, in November.

LARCH SAWFLY (Pristiphora erichsonii) defoliation ranged moderate to heavy over much of the 500,000 acres of eastern larch in MINNESOTA in 1969. The population has subsided slightly from that of 1968.

An ERIOPHYID MITE (Trisetacus pseudotsugae) was reported as a new State record in CALIFORNIA. It was found in Douglas-fir nursery stock at Half Moon Bay, San Mateo County, and later on native Douglas-fir at Saratoga Gap, Santa Cruz County.

Nymphs and adults of SPIDER MITES (Tetranychus spp.) infested Alberta spruce in nurseries at Portland, Multnomah County, OREGON. Many eggs were seen on needles of small ponderosa pines grown for Christmas trees. Control may be required before spring to prevent damage. Heavy numbers of SPRUCE SPIDER MITE (Oligonychus ununguis) in IDAHO noticeably webbed ornamental conifers at Challis, Custer County; Moscow, Latah County; Pocatello, Bannock County; and Rexburg, Madison County, in late August.

FOREST TENT CATERPILLAR (Malacosoma disstria) infested maple, ash, and elm in several areas and native chokecherry in 6 southwest counties of MONTANA. Defoliation in NORTH DAKOTA was complete on 1,000 acres of oak, ash, basswood, poplar, and elm in Benson County. The 1969 defoliation area in MINNESOTA was virtually the same as in 1968, except for a 200-acre outbreak in southern Otter Tail County. This location is about 125 miles southwest of the present infestation area which extends about 15 miles on all sides of International Falls. The very lightly infested area extends as far west as Lake of the Woods, south to Grand Rapids, Itasca County, and Virginia, St. Louis County, and east to Cook County. In 1969, weather favored forest tent caterpillar, and pupal parasitism was low. With higher egg mass counts, populations will increase in 1970. The area defoliated by forest tent caterpillar in MICHIGAN did not increase as expected. Defoliation was less severe in Antrim and Kalkaska Counties. Parasitism and disease were not high and weather was not a deterrent. Infestations occurred primarily on hard maple rather than aspen. Populations were most severe on high ground where maple predominates. The population for 1970 is not expected to increase dramatically. Forest tent caterpillar is a serious potential threat to economically important hardwoods in OHIO. About 5,000 trees, primarily maple, were defoliated in a 30-mile wide strip along the Ohio River in Monroe and Belmont Counties early in June. Damage to oaks ranged light to moderate in northern and eastern WEST VIRGINIA. Building up slowly, populations will probably peak in 1970. Additional buildup did not occur in the northeast section where this pest had been increasing during the past few years.

EASTERN TENT CATERPILLAR (Malacosoma americanum) counts were comparable to those of 1968 in NEBRASKA. Defoliation ranged 15-25 percent on wild plum in the southeast, particularly in Gage, Jefferson, and Saline Counties. Eastern tent caterpillar is probably the most important forest pest in OHIO for no other reason than sheer aggravation. It affects 90 percent or more of all wild cherry trees which are prevalent and widespread in the State. Large tents dotted the entire landscape in the south area late in April. By July, wild cherry began to recover from the severe defoliation. The heaviest eastern tent caterpillar infestations in recent years occurred throughout WEST VIRGINIA, except in the north-central region which had only a few tents. Because a wilt disease was prevalent, the population is expected to decrease in 1970. Heavy defoliation occurred on wild cherry and on isolated wild apple throughout MARYLAND. The heaviest defoliation occurred in Baltimore, Anne Arundel, Prince Georges, and Howard Counties.

FRUIT-TREE LEAF ROLLER (Archips argyrospilus) severely damaged yard and native oaks and damaged nearby ornamentals in CALIFORNIA. Larvae dangling from trees created a nuisance and large numbers of moths became a household and yard nuisance. A severe outbreak of LARGE ASPEN TORTRIX (Choristoneura conflictana) on aspen occurred in St. Louis and Lake Counties, MINNESOTA. Defoliation was lighter in Carlton, Cook, Koochiching, Lake of the Woods, and Beltrami Counties. Larvae of a TORTRICID MOTH (A. semiferanus) severely defoliated several thousand acres of oak, mostly black oak, in several northeast MICHIGAN counties. It has been severe for the last 3 or 4 years. Some tree mortality was evident. Natural control has exerted little noticeable reduction. Larvae of OAK LEAF TIER (Croesia semipurpurana) continued to infest red oaks in PENNSYLVANIA. There was a slight decline from 1968.

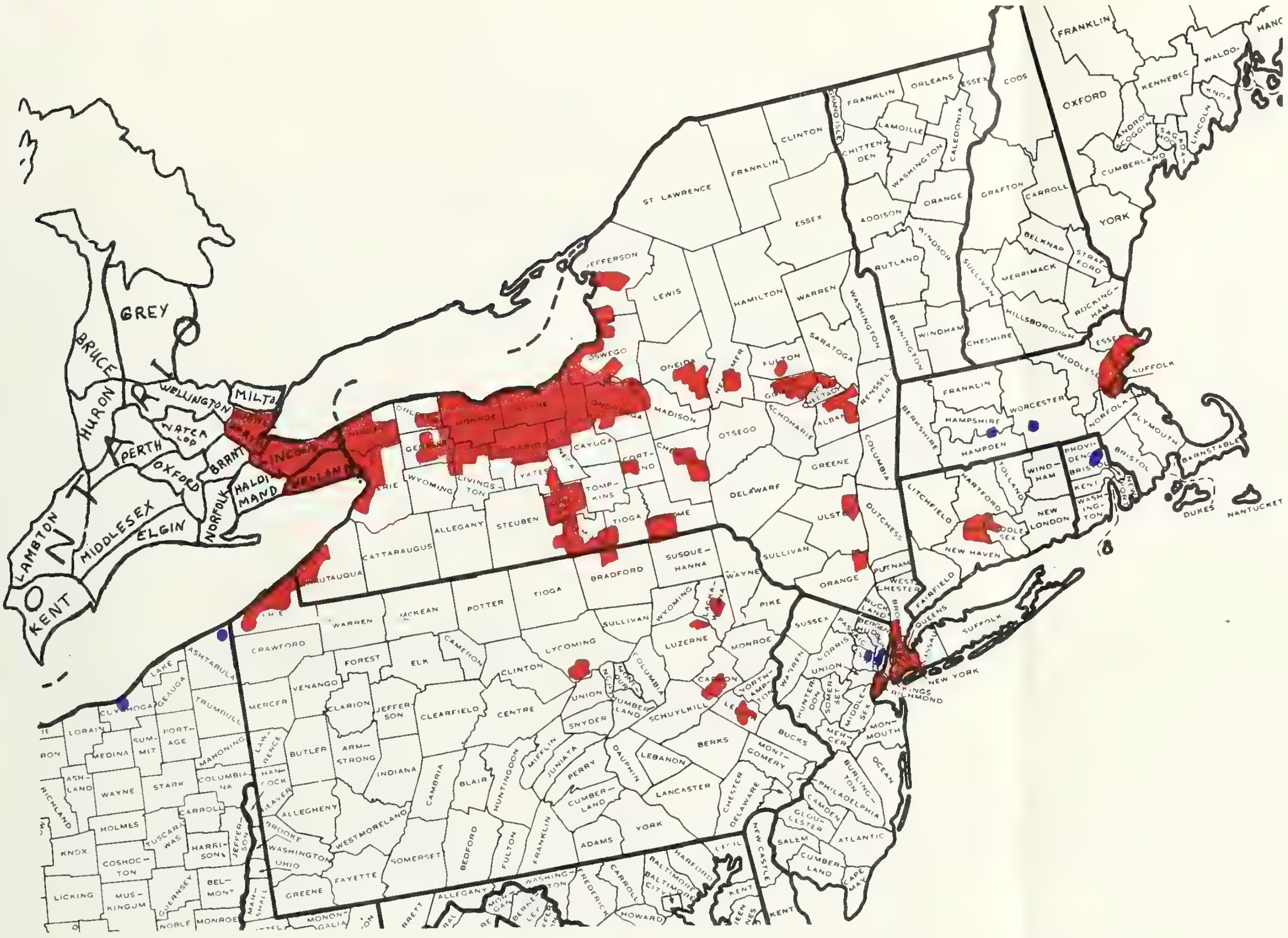
EUROPEAN CHAFER

COOPERATIVE FEDERAL, STATE, AND CANADIAN QUARANTINES

COUNTIES ENTIRELY COLORED ARE COMPLETELY REGULATED; COUNTIES PARTIALLY COLORED ARE PARTIALLY REGULATED.

🟥 GENERALLY INFESTED AREA - STATE, FEDERAL, AND CANADIAN REGULATIONS. (ERADICATION TREATMENTS NOT IN PROGRESS OR PLANNED)

🟦 STATE REGULATIONS ONLY. (SUPPRESSIVE TREATMENTS IN PROGRESS OR PLANNED)



RESTRICTIONS ARE IMPOSED ON MOVEMENT OF REGULATED ARTICLES FROM A REGULATED AREA AS FOLLOWS:

1. RED INTO OR THROUGH WHITE OR BLUE.
2. BLUE INTO ANY OTHER AREA WHEN REQUIRED BY APPROPRIATE STATE QUARANTINE OR BY AN AUTHORIZED INSPECTOR.

> IN THE UNITED STATES, CONSULT YOUR STATE OR FEDERAL PLANT PROTECTION INSPECTOR OR YOUR COUNTY AGENT AND, IN CANADA, YOUR NEAREST PLANT PROTECTION DIVISION OFFICE FOR ASSISTANCE REGARDING AREAS UNDER REGULATION AND REQUIREMENTS FOR MOVING REGULATED ARTICLES.

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PROTECTION DIVISION AND
CANADIAN DEPARTMENT OF AGRICULTURE
COOPERATING WITH AFFECTED STATES

Revised Feb. 27, 1970

SEE REVERSE SIDE FOR REQUIREMENTS CONCERNING CERTIFICATION OF REGULATED ARTICLES.

THE FOLLOWING CROPS OR ARTICLES MUST BE MOVED UNDER CERTIFICATE OR PERMIT YEAR-ROUND EXCEPT AS INDICATED

1. Soil, compost, decomposed manure, humus, muck, and peat, separately or with other things.

   Soil samples shipped to Corps of Engineers Soil Laboratories are exempt*.

   Soil samples of one pound or less shipped to designated laboratories** are exempt*.

   Compost, decomposed manure, humus, and peat are exempt*** if dehydrated, ground, pulverized, or compressed.

2. Plants with roots, except soil-free aquatic plants, moss, and Lycopodium (clubmoss or ground-pine or running pine).

3. Grass sod.

4. Plant crowns and roots for propagation.

5. True bulbs, corms, rhizomes, and tubers of ornamental plants when freshly harvested or uncured.

   True bulbs, corms, rhizomes, and tubers (other than clumps of dahlia tubers) of ornamental plants are exempt*** if free of soil.

6. Used mechanized soil-moving equipment.

   Used mechanized soil-moving equipment is exempt*** if cleaned and repainted.

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* Effective July 1, 1970, soil samples of any size may be moved from regulated areas to any approved laboratory, including the U. S. Army Corps of Engineers, without a certificate or permit attached.

** Information as to designated laboratories may be obtained from an inspector.

*** Exempt if not exposed to infestation after cleaning or other prescribed handling.

GPO 964-435

RIABLE OAK LEAF CATERPILLAR (Heterocampa manteo) completely defoliated 150 res of oaks and birches in the Killdeer Mountains in Dunn County, NORTH DAKOTA. DDLED PROMINENT (H. guttivitta) defoliation of maple and oak in isolated areas Wexford and Grand Traverse Counties, MICHIGAN, indicated possibly more trouble 1970. Much of the forested stands are predominantly hardwoods, a preferred st. H. guttivitta was again abundant in areas of Wayne, Monroe, Pike, Lacka- anna, and Susquehanna Counties in PENNSYLVANIA. Over 50,000 acres of forests ere defoliated. A virus disease was active in heavily infested areas. In southern ayne County up to 90 percent of the larvae were diseased.

PRING CANKERWORM (Paleacrita vernata) occurred in the usual infestations in the orthern Black Hills of SOUTH DAKOTA. It also damaged shelterbelts near Miller, and County; Chamberlain, Brule County; Highmore, Hyde County; and Mission, Todd ounty. Twenty-two acres of shelterbelts were treated at Highmore by the end of ay. The most serious infestation of P. vernata and FALL CANKERWORM (Alsophila ometaria) in MINNESOTA occurred at St. Paul, Ramsey County, where 40 blocks of lms were almost completely defoliated. In MICHIGAN, P. vernata and A. pometaria efoliation was heavy in parts of Muskegon, Ingham, and Oakland Counties. The 970 outlook is much the same, but because parasitism is high in several locali- ies, levels may not increase much in 1970.

IMOSA WEBWORM (Homadaula anisocentra) was reported from Glenn County, CALIFORNIA, or a new county record. Damage was moderate to heavy on mimosa in east and entral OKLAHOMA from early June to mid-October. Nine new counties were found infested in 1969. Injury was moderate to heavy on honeylocust throughout east KANSAS and light to moderate on mimosa in southeast and south-central areas. Mimosa webworm was the major pest of mimosa throughout ALABAMA. Infestations were heavy in east and central TENNESSEE in late summer and early fall with locally heavy damage. On honeylocust and mimosa in the southwest and south-central districts of INDIANA by June 20, populations approached economic levels by mid-September in western districts. Mimosa webworm infested 50-75 percent of the honeylocust in west and south OHIO. Numbers were very abundant on mimosa and honeylocust throughout DELAWARE.

FALL WEBWORM (Hyphantria cunea) was as heavy as in 1968 in OREGON, especially in the Columbia River Gorge and the Willamette Valley. Larvae started leaving their webs the first week in September, about 2 weeks earlier than in 1968. Shade trees were damaged throughout most of NEW MEXICO. Defoliation was noticeable in central and west TENNESSEE in August and September. Fall webworm is about as large a problem in the fall in OHIO as eastern tent caterpillar is in the spring. Webs became abundant in mid-August. The heaviest populations occurred in Monroe, Belmont, and Harrison Counties where they were most common on wild cherry and walnut trees. In WEST VIRGINIA fall webworm infested wild cherry and hickory in Hancock and Brooke Counties. It spread southward from Hancock into Ohio County. By early July, first-generation larvae were common on a variety of trees throughout DELAWARE. Second-generation larvae appeared from mid to late August.

Larvae of a GEOMETRID MOTH (Eulype hastata) defoliated at least 40 percent of the white birch in the northern Black Hills of SOUTH DAKOTA in August. Injury was probably minimal, but some losses in vigor may have occurred. LINDEN LOOPER (Erannis tiliaria) declined in the eastern panhandle of WEST VIRGINIA. Fifteen to twenty percent of the hardwood stands in Morgan and Berkeley Counties were affected. Adults of a GEOMETRID MOTH (Physostegania pustularia) caused considerable nuisance and some alarm in areas of Perry, Dauphin, Bedford, and Northumberland Counties, PENNSYLVANIA. Although moths were extremely abundant about lights in late June, larval feeding on red maple was light.

Larval infestations of a PSYCHID MOTH (Apterona crenulella) at Mountain Home, IDAHO, in early June added Elmore County to the list of counties where damaging numbers have occurred. Larvae infested young elms at American Falls, Power

County, and damaged a home garden at Heyburn, Minidoka County. BAGWORM (*Thyridopteryx ephemeraeformis*) injury to locust was severe in some cases and especially noticeable in early August when most larvae were fully grown in DELAWARE.

CALIFORNIA OAKWORM (*Phryganidia californica*) was unusually damaging in San Diego County, CALIFORNIA, and completely defoliated oaks along the coast highway from Kings County to Monterey County. BOXELDER LEAF ROLLER (*Gracillaria negundella*) defoliated several thousand boxelder trees in UTAH in the mouths of canyons in Cache, Box Elder, Weber, Davis, Salt Lake, and Utah Counties with scattered damage elsewhere. CARPENTERWORM (*Prionoxystus robiniae*) was the major pest of shelterbelt plantings and ornamental trees in MONTANA. A serious outbreak of ASH BORER (*Podosesia syringae fraxini*) in MINNESOTA occurred in a Minneapolis suburb on a municipal planting of green ash. Over 1,000 trees up to 5 inches in diameter were affected and mortality was high. Previous drought conditions were apparently a predisposing factor. Defoliation by larvae of a NOCTUID MOTH (*Enargia decolor*) was moderate on quaking aspen over a 3 million-acre area in north-central MINNESOTA in July. Defoliation occurred mostly on smaller aspen, both open and forest understory, and on scattered areas of forest type of all sizes. Larvae of an OLETHREUTID MOTH (*Pseudexentera cressoniana*) severely infested white oaks on over 200,000 acres in PENNSYLVANIA, extending from Lycoming County to Lancaster County.

ELM LEAF BEETLE (*Pyrrhalta luteola*) was unusually heavy in CALIFORNIA. Numbers were above normal and damaging in many localities and counties in UTAH. In IDAHO the first eggs were found at Parma, Canyon County, May 6, and the first adult damage was observed April 18. In WYOMING, elm leaf beetle defoliated many elms at Wheatland, Platte County, and Torrington, Goshen County. This insect usually does not cause much damage. The pest continued to spread to new areas in NEW MEXICO. Siberian elms in Quay and De Baca Counties were almost completely defoliated. Elms in TEXAS were seriously damaged in many south Plains counties. Infestations were heavy in many Rolling Plains and Trans-Pecos counties. Elm leaf beetle was heavy in some areas of OKLAHOMA, but in general, damage was not so heavy as in 1968 in most of the State. This leaf beetle was the most widespread insect pest of shade trees in KANSAS where defoliation of Siberian elms was very severe. Elms on lawn and street plantings were damaged from central to north ALABAMA. Heavy damage occurred locally throughout TENNESSEE. Counts in WEST VIRGINIA were heavier than in recent years. Elms were damaged in north-central counties and in the northern and eastern panhandle counties. Elm leaf beetle larvae were common on some elms in mid-July in DELAWARE.

COTTONWOOD LEAF BEETLES (*Chrysomela scripta* complex) were common on willows in several UTAH counties. This complex was heavy on cottonwoods in MONTANA at Roundup, Musselshell County; Loma, Chouteau County; and Terry, Treasure County. In NORTH DAKOTA up to 30 larvae per leaf damaged poplars and willows in Dickey County. Larvae damaged cottonwoods in Adams and Williams Counties.

ALDER FLEA BEETLE (*Altica ambiens*) was severe on alder and willow in some north CALIFORNIA counties. *Altica plicipennis* had caused much damage to willows by mid-August along the Little Missouri River near Camp Crook in Harding County, SOUTH DAKOTA. ELM CALLIGRAPHA (*Calligrapha scalaris*) was much more common than usual in OKLAHOMA. American elms were damaged in many counties in all areas except in the northeast and southeast areas.

LOCUST LEAF MINER (*Xenochalepus dorsalis*) was widespread in OHIO and exceptionally populous in the counties along the Ohio River. Black locusts in Scioto County were rust colored from larval and subsequent adult feeding by mid-July. Found throughout WEST VIRGINIA, defoliation was heaviest, 50-75 percent, in Kanawha, Putnam, Boone, Cabell, Mason, and Lincoln Counties. Black locust was severely damaged in the southwest area. Noticeable throughout the State, locust leaf miner was not so damaging as expected in the north area. Although damage to black locust appeared lighter than last year, damage remained heavy in all sections of MARYLAND.

SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*) was locally heavy on elm in a few scattered locations in CALIFORNIA. Populations have been low for the past few years. Wasco County, OREGON, was a new county record. In SOUTH DAKOTA, this bark beetle was taken from dying elms in the city park at Pierre, Hughes County, in October. This is a new county record. Adults emerged the first week of May in Lancaster County, NEBRASKA. Dutch elm disease spread into Thomas, Logan, and Dundy Counties in 1969. The disease is now found in 70 counties in Nebraska. Smaller European elm bark beetle increased in southeast MINNESOTA. Dutch elm disease cases doubled this past season and spread into 7 new counties.

ASIATIC OAK WEEVIL (*Cyrtepistomus castaneus*) adult feeding was especially heavy, 30-80 percent defoliation, in the Cedar Mountain area of Madison County, MISSOURI.

WALKINGSTICK (*Diapheromera femorata*) defoliated over 3,200 acres of hardwoods west of Gull Lake near Brainerd, Crow Wing County, MINNESOTA. A GRASSHOPPER (*Dendrotettix quercus*) appeared in large numbers over 40,000 acres in northwest Iron and northeast Reynolds Counties, MISSOURI, and completely stripped hickory trees in the infested area.

Brood IX of PERIODICAL CICADA (*Magicicada septendecim*) appeared in southeast WEST VIRGINIA during summer. Heavy populations occurred in Fayette and Raleigh Counties, and damage was heavy in Fayette and Greenbrier Counties. A heavy and unusual occurrence of a LEAFHOPPER (*Alebra albostriella*) developed on elms at Oakland, Alameda County, CALIFORNIA. This is the second record in the State in 50 years.

OYSTERSHELL SCALE (*Lepidosaphes ulmi*) heavily infested green ash, willow, and poplar in WYOMING. *L. ulmi* infestations in SOUTH DAKOTA continued unabated on elm at Rapid City, Pennington County, and Spearfish, Lawrence County. OBSCURE SCALE (*Melanaspis obscura*) infested white, scarlet, and willow oaks in home and woodlot stands in Prince Georges County, MARYLAND. The eulophid wasps, *Coccophagoides fuscipennis*, *Prospaltella berlesei*, *Ablerus clisiocampae*, and *Physcus varicornis*, were the most prevalent parasites in the area. EUROPEAN ELM SCALE (*Gossyparia spuria*) became widespread in CALIFORNIA late in the season when honeydew drip became a high nuisance. EUROPEAN FRUIT LECANIUM (*Lecanium corni*) killed many oaks in park areas in Oakland County, MICHIGAN. Several new infestations of CALICO SCALE (*L. cerasorum*) occurred in New Castle County, DELAWARE, especially on maple and sweetgum, with some infestations on sour cherry, mountain-ash, and flowering peach.

A STINK BUG (*Elasmucha lateralis*) collected on birch trees at Burney, Shasta County, was a new State record for CALIFORNIA. Defoliation by a PLANT BUG (*Tropidosteptes pacificus*) in OREGON was extensive to 2,500 three to four-year-old ash trees in a Portland, Multnomah County, nursery. Leaf browning was severe on ash at Salem, Marion County. ASH PLANT BUG (*T. amoenus*) threatened green ash in late July in some areas of Hill, Toole, and Gallatin Counties, MONTANA.

BROWN-HEADED ASH SAWFLY (*Tomostethus multicinctus*) defoliated ash in Shasta County, CALIFORNIA. BIRCH LEAF MINER (*Fenusa pusilla*) damage was heavy in Racine, Kenosha, Dane, Iowa, Calumet, Fond du Lac, Portage, Door, Eau Claire, Brown, and Marathon Counties, WISCONSIN. *F. pusilla* declined on gray birch in CONNECTICUT probably due to cold, wet weather at the time of adult emergence.

The spring adults of a MIDGE (*Dasineura gleditchiae*) emerged from heavily infested honeylocust at Blackfoot, Bingham County, IDAHO, early in May. Larvae and pupae were numerous by May 27. Infestations occurred at Weiser, Washington County, and at Lewiston, Nez Perce County. The Lewiston record was the first known infestation in northern Idaho.

The following summary is the highlights section of the "Forest Insect Conditions in the United States - 1969" which was compiled and published by the Forest Service, U.S. Department of Agriculture. Copies of the complete annual summary are available upon request from the Regional Forester or Area Director in your area. Addresses of the regional offices may be found on page 229 in this issue of the CEIR.

Situation in the Western States

The major forest insect pests in the Western States were pine BARK BEETLES. Several new outbreaks and the continuation of existing ones continued to deplete forest resources in the West. Many of the new infestations developed in areas of severe stand disturbance caused by a variety of factors such as adverse weather, man's activities in the forest, and air pollution. In addition to BARK BEETLES, outbreaks of DEFOLIATORS, SAP-SUCKING INSECTS and TIP MOTHS caused damage in many locations. The following summarize the most serious problems in the various regions of the West.

A general increase in forest insect activity was observed throughout the ALASKA region. Rapidly expanding populations of SPRUCE BEETLE (*Dendroctonus obesus*) erupted on parts of the Kenai Peninsula where more than 40,000 acres of white spruce stands were heavily damaged. Less spectacular but serious infestations also occurred near Anchorage and on the Tongass National Forest. Drought, windstorm, and man's activities in the forest have triggered several of these outbreaks. Infestations from other pests, such as REDWOOD BARK BEETLE (*Phloeosinus sequoiae*), FLATHEADED FIR BORER (*Melanophila drummondi*), BLACK-HEADED BUDWORM (*Acleris variana*), and HEMLOCK SAWFLY (*Neodiprion tsugae*), all showed an upswing in activity. LARGE ASPEN TORTRIX (*Choristoneura conflictana*) was the only major pest that indicated a downward trend.

Forest insect damage in OREGON and WASHINGTON was less than in previous years. However, BARK BEETLES continued to inflict heavy timber losses in several areas, killing more than one-half billion board feet of sawtimber. Most of this damage was attributed to DOUGLAS-FIR BEETLE (*Dendroctonus pseudotsugae*), FIR ENGRAVER (*Scolytus ventralis*), SPRUCE BEETLE (*D. obesus*), MOUNTAIN PINE BEETLE (*D. ponderosae*), and WESTERN PINE BEETLE (*D. brevicomis*). DEFOLIATORS were widespread but caused little damage overall. LARCH CASEBEARER (*Coleophora laricella*) continued to spread in Washington but thus far has not reached Oregon. Other forest pest populations followed a downward or static trend.

In CALIFORNIA, forest insect infestations were at the lowest level in several years. An outbreak of WESTERN PINE BEETLE near McCloud continued to deplete overstocked ponderosa pine stands but declined in area and severity. For the second consecutive year infestations of SCALE INSECTS increased in various areas of the State.

The overall forest insect situation improved in the northern Rocky Mountains but WESTERN BUDWORM (*Choristoneura occidentalis*), LARCH CASEBEARER, MOUNTAIN PINE BEETLE, and DOUGLAS-FIR BEETLE continued to cause serious damage. Noteworthy was the collapse of a SPRUCE BEETLE outbreak in northwestern MONTANA. Long standing outbreaks of WESTERN BUDWORM decreased east of the Continental Divide but increased west of the Divide, particularly on the Nezperce National Forest, IDAHO. Other forest insect pests were PINE ENGRAVER (*Ips pini*), FIR ENGRAVER, PINE BUTTERFLY (*Neophasia menapia*), and a PINE LOOPER (*Phaeoura mexicanaria*).

During the past decade MOUNTAIN PINE BEETLE dominated the forest insect situation in the Intermountain States. Long standing outbreaks in northeastern IDAHO, western WYOMING, and northern UTAH continued to deplete mature and overmature stands of lodgepole and ponderosa pine. Vigorous control programs were successful in some areas while in others, uncontrolled outbreaks continued. DOUGLAS-FIR BEETLE activity increased throughout southern IDAHO, and in some areas the mortality may exceed the allowable annual cut. Heaviest damage occurred on the Boise and Payette National Forests where populations have increased since 1965. A combination of natural factors and a trap-tree program minimized an expected increase in SPRUCE BEETLE activity in southeastern IDAHO and western WYOMING. Natural factors also reduced WESTERN BUDWORM populations in southern Idaho and western Wyoming.

MOUNTAIN PINE BEETLE infestations continued to dominate the forest insect situation in the central Rockies. Epidemic populations were present on nine National Forests as well as other Federal, State, and private lands throughout the region. An accelerated salvage program and limited chemical control have reduced beetle populations and timber losses considerably in some areas but most of the infestations continued uncontrolled. SPRUCE BEETLE has become epidemic on the Medicine Bow National Forest where more than 7,000 standing trees are currently infested. Salvage logging and trap-tree programs are expected to control this outbreak. Freezing temperatures and increased parasitism were responsible for a further decline in the WESTERN BUDWORM population which is at the lowest level in 11 years.

In the Southwest, damage by SPRUCE BEETLE continued to climb for the third consecutive year. Serious timber mortality occurred in several areas throughout the region, especially in northern NEW MEXICO and eastern ARIZONA. MOUNTAIN PINE BEETLE and ROUNDHEADED PINE BEETLE (Dendroctonus adjunctus) populations also increased.

Situation in the Southern and Southeastern States

SOUTHERN PINE BEETLE (Dendroctonus frontalis) continues to be the principal forest pest in the South and the Southeast. A severe outbreak increased in extent and severity in the southern Appalachian Mountains while on the National Forests in TEXAS, populations subsided to an endemic level. Other infestations occurred in the gulf coast area, Piedmont, and Atlantic Coastal Plains. New infestations were reported in southeastern TEXAS, northeastern LOUISIANA, and adjoining portions of ARKANSAS. Hurricane Camille left an abundance of beetle susceptible material scattered over 1.9 million acres in southeastern MISSISSIPPI. ENGRAVER BEETLES have already begun to build up in windthrown trees in this area. BALSAM WOOLLY APHID (Adelges piceae) continued to be a problem in the Fraser fir type in the southern Appalachians. Mount Rogers is now the only major fir area in the Southeast free of infestation. Other important insects were BLACK TURPENTINE BEETLE (D. terebrans), FOREST TENT CATERPILLAR (Malacosoma disstria), NANTUCKET PINE TIP MOTH (Rhyacionia frustrana), FALL CANKERWORM (Alsophila pometaria), and several species of PINE SAWFLIES.

Situations in the Lake and Central States and the Northeast

DEFOLIATORS were the most destructive forest pests in the eastern region. More than three million acres of forest were defoliated during the past year. GYPSY MOTH (Porthetria dispar) continued to increase in extent and severity throughout the New England area. State and Federal agencies are extremely concerned over its southward spread into DELAWARE and MARYLAND. SPRUCE BUDWORM (Choristoneura fumiferana) populations have increased in northern MINNESOTA for the third consecutive year. An infestation in MAINE threatens to cause increased tree mortality in 1970. SADDLED PROMINENT (Heterocampa guttivitta) caused heavy defoliation on more than one million acres in New England. Populations of JACK-PINE BUDWORM (C. pinus) declined in the Lake States. A complex of CANKERWORMS and LOOPERS caused varying degrees of defoliation throughout the Northeast. One million acres of defoliation were attributed to a complex of LEAF ROLLERS and LEAF TIERS. FOREST TENT CATERPILLAR continued to cause heavy defoliation in MINNESOTA; however, a reduction in population levels was reported in MICHIGAN, ILLINOIS, and VERMONT. New infestations were detected in OHIO, WEST VIRGINIA, PENNSYLVANIA, and MINNESOTA. BEECH SCALE (*Cryptococcus fagi*) and its associate fungus are causing widespread destruction of commercial size beech trees in New England. Chemical control was applied to SARATOGA SPITTLEBUG (*Aphrophora saratogensis*) populations in WISCONSIN and MICHIGAN. Freezing winter temperatures reduced BALSAM WOOLLY APHID population in parts of New England but tree mortality continued in many areas. Two insecticides showed promise in controlling PINE TUSSOCK MOTH (*Dasychira plagiata*) in MINNESOTA.

Suppression Activities

During 1969 land managers, Federal, State, and private, continued their cooperative effort to curb destructive forest insect outbreaks and reduce insect populations to manageable levels. More then $10 million was spent in 1969 for suppression and developing and testing new and more effective methods of survey and control.

Criteria for suppression continued to receive increased attention. At the beginning of the decade large scale aerial spray projects involving several hundred thousand acres of forest land were quite common. Since 1963 the acreage treated by aircraft has decreased from 1.5 million acres to less than 33 thousand acres in 1969. Of more importance was the discontinued use of the persistent pesticides to control defoliating insects. Most of the acreage sprayed in 1969 was for pilot testing promising nonpersistent insecticides against the spruce budworm.

Virulent and widespread outbreaks of the mountain pine beetle continue to plague the Western States, particularly Idaho, Utah, and Wyoming. Land managers treated over 403,000 beetle infested trees in 1969 in an attempt to reduce beetle populations to manageable levels.

In the Southeast and Gulf States, Federal, State, and private agencies relied almost entirely on nonchemical methods for suppression of serious southern pine beetle infestations. Effective control was obtained in North Carolina, Texas, Louisiana, Georgia, South Carolina, and Alabama. Land managers treated over 439,000 beetle infested pines. Harvesting beetle infested trees was the primary means of control, along with piling and burning or chemically treating infestations in inaccessible areas.

Other bark beetles requiring suppression were spruce beetle, Douglas-fir beetle, western pine beetle, roundheaded pine beetle, and several species of pine engravers. Salvage of infested timber, various silvicultural treatments, and limited use of chemicals were the primary controls used against these pests.

Major defoliators requiring control were western budworm in the Western States, spruce budworm, gypsy moth, saddled prominent, and a complex of leaf rollers and cankerworms in the Northeast. Successful control of gypsy moth was obtained on 61,250 acres in New York and New Jersey with aerial applications of carbaryl.

Federal, State, and private agencies are working together to find more effective means of detection and suppression to limit the spread of this serious pest.

In Minnesota 10,000 acres were aerially sprayed for control of spruce budworm. Zectran 1/ was tested for the third consecutive year against western budworm. Two 4,000-acre plots were sprayed with 0.15 pound of Zectran in one-half gallon of TPM carrier per acre. A C-47 aircraft was used to apply the chemical. Problems in getting the spray to the target insect caused results to be erratic.

1/ Trade names used in this article are solely for the purpose of providing specific information. This does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture over other products not mentioned.

Other pilot projects and insecticide tests were conducted in various sections of the country. In Washington, stabilized pyrethrins were tested against WESTERN HEMLOCK LOOPER (Lambdina fiscellaria lugubrosa). Preliminary analysis of data indicated this botanical insecticide to be effective at the rate of 0.2 pound per acre. In Wisconsin, Landrin was more effective than Gardona, Matacil, or Sevin for controlling jack-pine budworm. Sevin and Matacil provided sufficient control of the pine tussock moth in experiments by the Minnesota Department of Agriculture.

In the South, a pilot test of phorate systemic insecticides showed excellent control of Nantucket pine tip moth. Excellent control of fall cankerworm infestations was achieved in a test by the Virginia Division of Forestry with aerial applications of Gardona at the rates of one-half and one pound per acre.

There were numerous small projects in high-value recreation areas for control of PINYON NEEDLE SCALE (Matsucoccus acalyptus), NEVADA BUCK MOTH (Hemileuca nevadenis), balsam woolly aphid, tent caterpillars, and many other forest insects.

A summary of major pest control operations for 1969 is presented in the following tabulations:

Pest Control Accomplishments in the United States, 1969

Insect	Location	Trees Treated	Acres Sprayed
Southern pine beetle	South and Southeast	439,588	
Black turpentine beetle	South and Southeast	18,277	
Mountain pine beetle	Idaho, Utah, Montana, Colorado, South Dakota, and Wyoming	364,222	
Bark beetles 1/	California, Oregon, and Washington	64,876	
White pine weevil	New York	308,400	
Balsam woolly aphid	North Carolina	43,000	
European pine shoot moth	Washington, and Oregon	11,735	
Saratoga spittlebug	Wisconsin		135
Leaf rollers and fall cankerworm	New Jersey		9,836
Spruce budworm	Idaho, Montana, and Minnesota		23,868
Miscellaneous	Entire United States	1,269	
Total		1,251,367	33,839

1/ Reported in various combinations of western pine beetle, mountain pine beetle, ips, flathead borers, etc.

REGIONAL AND AREA OFFICE ADDRESSES

U.S. FOREST SERVICE

Region

1 U.S. Forest Service
Federal Building
Missoula, Montana 59801

2 U.S. Forest Service
Federal Center, Building 85
Denver, Colorado 80225

3 U.S. Forest Service
Federal Building
517 Gold Avenue, S.W.
Albuquerque, New Mexico 87101

4 U.S. Forest Service
Federal Office Building
324 - 25th Street
Ogden, Utah 84401

5 U.S. Forest Service
630 Sansome Street
San Francisco, California 94111

Region

6 U.S. Forest Service
P.O. Box 3623
Portland, Oregon 97208

10 U.S. Forest Service
Federal Office Building
P.O. Box 1628
Juneau, Alaska 99801

Area

NA Northeastern Area
U.S. Forest Service
6816 Market Street
Upper Darby, Pennsylvania 19082

SA Southeastern Area
U.S. Forest Service
Suite 800
1720 Peachtree Road, N.W.
Atlanta, Georgia 30309

Weather of the week continued from page 210.

TEMPERATURE: Gale force winds continued winter chill over the Northern States early in the week. In contrast, afternoon temperatures reached the 70's and 80's in the south-central and southeastern States and the low 90's at a few desert locations in California. As cold fronts advanced southward, they brought the late winter chill to most of the Nation continuing the cool trend that had persisted during the two previous weeks. Subzero temperatures occurred in eastern North Dakota and northern Minnesota on 1 or 2 days. Spencer, Iowa, registered 6° below zero on Saturday morning. Subfreezing weather advanced far southward on Tuesday and Friday with Atlanta, Georgia, registering 32° on those days. Most of the area east of the Rocky Mountains averaged 3° to 9° below normal. Eastern New York, eastern Pennsylvania, northern New Jersey, and New England averaged slightly above normal. The Far West also averaged above normal. Mild temperatures prevailed over the Great Basin early in the week but colder weather beginning about midweek more than offset the warm beginning. (Summary supplied by Environmental Data Service, ESSA).

CONTRIBUTORS

ALABAMA
H.F. McQueen

ARIZONA
J.E. May

ARKANSAS
W.P. Boyer

CALIFORNIA
R.M. Hawthorne

COLORADO
T.E. Johnson

CONNECTICUT
M. Savos
S.W. Hitchcock

DELAWARE
P.P. Burbutis
L.P. Kelsey

FLORIDA
F.W. Mead et al.

HAWAII
G. Funasaki

IDAHO
A.R. Gittins

ILLINOIS
H.B. Petty
S. Moore
R. Randell
T. Cooley

INDIANA
R.W. Meyer

IOWA
H. Gunderson

KANSAS
J.H. Simpson

MARYLAND
J.L. Hellman

MICHIGAN
R.L. Janes et al.

MINNESOTA
R. Flaskerd

MISSISSIPPI
C.F. Sartor

MISSOURI
R.E. Munson

MONTANA
R. Pratt

NEBRASKA
D.L. Keith

NEVADA
L.M. Burge

NEW JERSEY
S.R. Race

NEW MEXICO
G.L. Nielsen

NORTH DAKOTA
W.J. Brandvik

OHIO
F.T. Richter

OKLAHOMA
D.C. Arnold

OREGON
D.S. Horning

PENNSYLVANIA
S.G. Gesell

RHODE ISLAND
G. Field

SOUTH DAKOTA
P.A. Jones

TENNESSEE
C.D. Gordon

TEXAS
L.R. Green

UTAH
G.F. Knowlton
R.S. Roberts

VIRGINIA
W.A. Allen et al.

WASHINGTON
J.T. Pennell
A.H. Retan

WEST VIRGINIA
J.D. Hacker

WISCONSIN
M.S. Conrad

WYOMING
A.E. Parshall

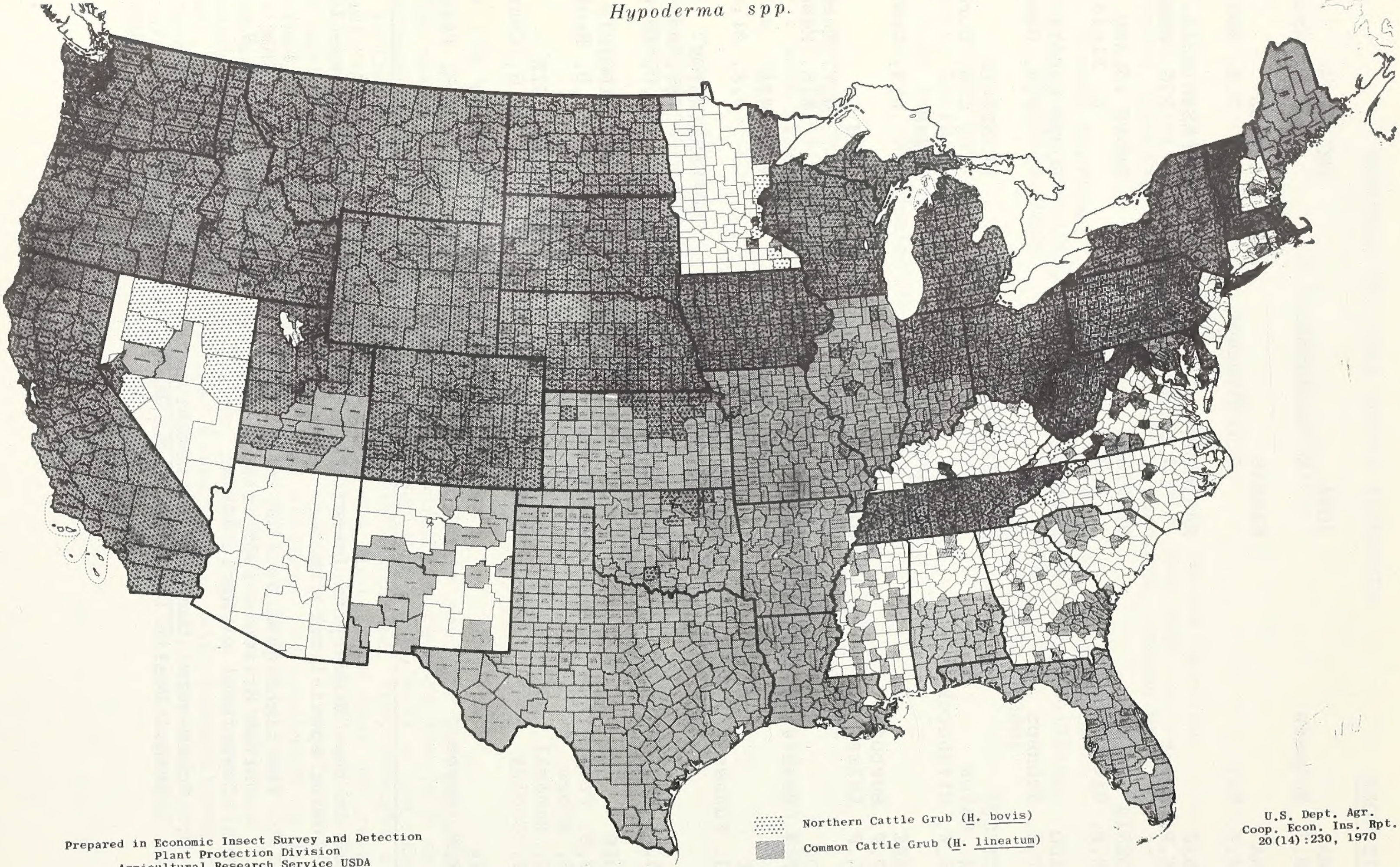
Included in the "Summary of Insect Conditions in the United States - 1969" are the following special reports:

1. The highlights section of Forest Insect Conditions in the United States - 1969, compiled by the Forest Service, U.S. Department of Agriculture.

2. Screw-worm (*Cochliomyia hominivorax*) Summary compiled by Animal Health Division, U.S. Department of Agriculture.

Distribution of Cattle Grubs

Hypoderma spp.



░ Northern Cattle Grub (H. bovis)
▨ Common Cattle Grub (H. lineatum)

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